

UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: BARTON L. SMITH)
 TITLE: THERMOACOUSTIC COOLING)
 DEVICE)
 SERIAL NO.: 10/811,479)
 FILED: March 25, 2004) DECLARATION OF BARTON L.
) SMITH UNDER 37 C.F.R. §
) 1.132
 EXAMINER: W. Doerrler)
 ART UNIT: 3744)

Mail Stop Amendment
 Commissioner for Patents
 P.O. Box 1450
 Alexandria, Virginia 22313-1450

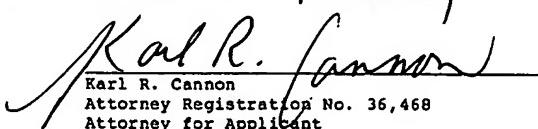
Sir:

BARTON L. SMITH hereby declares:

1. I am an inventor of the above-captioned invention entitled Thermoacoustic Cooling Device;
2. I am an Assistant Professor of Mechanical and Aerospace Engineering and the Director of the Experimental Fluid Dynamics Laboratory at Utah State University;

Certificate of Deposit Under 37 C.F.R. § 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail, postage prepaid, in an envelope addressed to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on the 20 day of February, 2007.

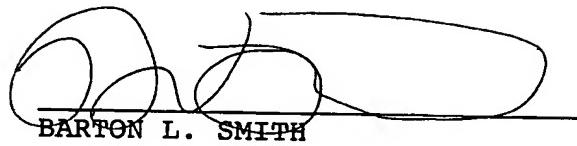

 Karl R. Cannon
 Attorney Registration No. 36,468
 Attorney for Applicant

3. I am making this declaration to provide evidence of working examples of at least a portion of the invention described and claimed in the above-captioned application, within the scope of the written description provided therein, to overcome a rejection of claims made by the U.S. Patent Office;
4. I have been involved with the construction of at least two (2) working examples of a device in accordance with the above-captioned application;
5. In the first working example, an engine was formed using a glass tube having a length of 7.5 inches, and a diameter of 0.89 inches. A single orifice was provided having a diameter of 0.89 inches located at an end of the engine. The engine was sealed to the atmosphere except at the orifice. A stack was provided comprising a ceramic material, having channels coaxially aligned with the glass tube. The stack had a length of 0.8 to 1.0 inches and a diameter of 0.89 inches. The stack was positioned 3.4 inches from the orifice. A heat exchanger was used comprising a nichrome wire having a diameter of 0.01 inches, and a direct current, 5 volt 3 amp power supply was used to provide heat on the hot side of the stack.
6. A second working example included a cylindrical tube split into two portions corresponding roughly with hot and cold portions of the engine. The upper or cold portion of the engine was formed of aluminum, and the lower or hot portion of

the engine was formed of copper. The engine had a length of 10.11 inches (the bottom portion measuring 2.36 inches and the upper portion measuring 7.75 inches) and a diameter of 2.079 inches. A single orifice was located at an end of the engine having a diameter of 2.079 inches. A ceramic stack having a length of 1.25 inches and a diameter to fit snugly within the bottom of the aluminum portion of the engine was used. The stack had a grid of openings extending coaxially with the engine. A nichrome, electrically powered, parallel plate heat exchanger was used on the bottom of the stack.

7. Both the first working example and the second working example were built consistent with the written description in the above-captioned patent application, and collectively yielded results including the formation of a synthetic jet that was expelled from the device;
8. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful, false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful, false statement may jeopardize the validity of the application or any patent issuing thereon.

DATED this 20 day of February, 2007.



A handwritten signature in black ink, appearing to read "BARTON L. SMITH". The signature is somewhat stylized and includes a horizontal line underneath it.

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